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METHOD FOR THE COVERING OF FOOD WITH POLYENE ANTIFUNGAL COMPOSITIONS

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METHOD FOR THE COVERING OF FOOD WITH POLYENE ANTIFUNGAL COMPOSITIONS

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Field of the invention

The present invention relates to a process to prevent mould growth on a food product treated with powders like flour to obtain a mould-like appearance. Also products treated with said process, e.g. food products such as sausages and cheeses are included in this invention.

Background of the invention

For more than 30 years natamycin has been used to prevent fungal growth on cheeses and sausages.

Cheeses are treated by immersion in a suspension of natamycin in water or covered by an emulsion of a polymer in water, mostly polyvinylacetate. Sausages are mainly treated by immersion or by spray coating with a suspension of natamycin in water. Usually aqueous suspensions for immersion treatments contain 0.1% to 0.2% w/v of natamycin, while in general polymer emulsions for coating purposes contain 0.01% to 0.05% w/v of natamycin.

Mostly these treatments are effective in preventing growth of moulds or yeasts on the treated products. The solubility of natamycin in water is 30 – 50 ppm (Brik, H.; "Natamycin" Analytical Profiles of Drug Substances 10, 513-561 (1981)), while its Minimal Inhibitory Concentration (MIC) for most foodborn fungi is less than 10 ppm. Under normal conditions the amount of dissolved natamycin will be sufficient to protect food products such as cheeses or sausages against fungal spoilage. Slow dissolution from the natamycin crystals will even protect a treated product for a longer period of time, which is one of the most important advantages of polyene fungicides such as natamycin.

In case of a fungicide with a low solubility of which only the dissolved fraction has antifungal activity, such as natamycin the following factors will determine the final fungicidal effect: the dissolution of the fungicide, the diffusion of the dissolved fungicide to the site of action and the degradation of the fungicide. Dissolved polyene fungicides may be degraded by several ways, e.g. by hydrolysis, by the action of light or by its

irreversible binding to the fungal cell membrane leading to lyses of the fungal cell. In most cases the efficacy of polyene fungicides, such as natamycin, will not be limited, because elimination of dissolved natamycin will be compensated sufficiently by dissolution of undissolved natamycin and by diffusion of dissolved natamycin to the side of action. Further the MIC value for most fungal species is below the solubility of the
5 fungicide.

Mould protection in the meat industry can normally obtained by soaking the to be used casing or dipping of the produced sausage in a suspension of polyene fungicides, e.g. natamycin, when applied on dried fermented sausages.

10 Usually aqueous suspensions for such immersion treatments contain 0.05% to 0.1% w/v of natamycin and usually in combination with 8 – 10% (w/v) NaCl.

In a large part of the dried fermented sausage industry, traditional surface ripening is obtained by addition of moulds.

15 In part of the traditional surface ripened sausages market the ripened and visible moulded sausages are cleaned by washing before selling.

In case that the product will be sold as traditional ripened moulded sausage the sausages may be covered with a mould-like, food grade powder like starch or flour.

Adhesion of the final mould-like product is mostly done by battering or by special equipment or method like electrostatical adhesion.

20 The sausages are further on packed in vacuum, MAP or in permeable plastic bags.

Due to remaining mould spores and/or mycelium it may occur that moulds will start growing again during storage, which may result in an undesired presentation of the sausage.

25 There is a need for a mould free sausages which can be stored for at least two months.

Description of the invention

30 The present invention relates to a process to add powder together with polyene fungicides, e.g. natamycin, to obtain a mould-like appearance to the surface of a foodstuff such as a sausage. The present invention also relates to a composition comprising powder and a polyene fungicide, which is useful for e.g. combatting moulds and yeasts on foodstuff such as a fermented sausage. Preferably this composition can

be applied to sausages without the need of adjusting or changing the already applied methods and processes.

Unexpectedly it has been found that on the surface of a fatty dried fermented
5 sausage the activity of polyene fungicides, such as natamycin, when added in dry state can be sufficient to avoid undesired mould growth during storage.

When natamycin is applied, before visible moulds are present, a washing step may be avoided in some cases. Using the composition of the invention comprising a
10 powder such as flour, for example rice flour, together with a polyene fungicide, such as natamycin, a sausage presentation can be obtained with a mould-like appearance which is free of undesired mould formation during storage.

The polyene fungicide, preferably natamycin, is applied together with the powder in dry form without the usage of water as carrier or solvent. According to the present invention sausages can be obtained that can be stored at 12°C for at least 60 days,
15 which are free of visible mould growth on the coating. The sausages can be stored as such in open air and thus a plastic coating or storage under special conditions such as oxygen free conditions are not needed. By sausage having a mould-like appearance is meant a sausage that has been coated or treated with a powder, like flour or starch, to obtain a mould-like appearance.

The invention relates to methods of preparing antifungal compositions containing
20 an antifungal compound of the polyene type, preferably natamycin, and a powder with a mould-like appearance (when applied on a foosstuff) like flour or starch, preferably rice flour. Said compositions comprise an amount of polyene fungicides of preferably 10 – 5000 ppm natamycin, more preferably 50 – 2000 ppm and most preferably 100 – 1500
25 ppm. In general 0.005 – 10 mg of natamycin per dm² of surface area of the food is used, more preferably 0.01 – 7 mg natamycin per dm² and most preferably 0.1 – 5 mg natamycin per dm² is used.

In preferred aspect the composition of the invention the composition comprising
30 powder and antifungal agent is prepared by dry mixing the ingredients. Said composition has an activity towards fungi. Since only the dissolved fraction of a polyene fungicide has antifungal activity, it is surprising that said dry compositions have a remarkable activity against moulds and yeast when used on sausages.

The polyene fungicide may be, for example, natamycin, lucensomycin, nystatin or amphotericin B. Preferred polyenes are natamycin and amphotericin B, most

preferred is natamycin. Also crystal forms, derivatives and salts of polyene fungicides, which are for example described in European Patent Application EP-A-865738, may be used. Examples of possible crystal forms are α -natamycin, δ -natamycin and γ -natamycin. Examples of possible solvates are methanol and ethanol solvates of polyene fungicides. Examples of possible salts are calcium and barium salts of e.g. natamycin.

The powder can be composed of any food grade covering material and is mostly based on starch or flour or a combination thereof and has a food grade origin like wheat, barley, corn, rice, rye, soy, oat, breadcrumbs etc. The starch or flour may be pretreated or reformulated, e.g. chemically, enzymatically or physically treated, for example milled if required.

The composition of the invention may also comprise other functional additives like proteins, gums, salts, leavening agents, coloring agents, seasoning etc.

The color from the covering coating on the foodstuff can be any desired color from clear white to dark brown or even black.

Colour variations can be introduced by changing the powder grade, powder particle size, flour type, or by roasting the used powders and/or introducing colouring pigments.

The compositions according to the invention may be used in one or more steps on the fermented sausage. For example, two steps can be obtained by first pre-treating the foodstuff followed by the main treatment. All treatments are preferably done by means of dipping the foodstuff in the dry composition containing starch or flour and the polyene fungicide, for example dipping in combination with electrostatic adhesion. Food products such as cheeses and sausages, preferably sausages are treated in this way. Whole or part of cheeses can be used in this method. According to the present invention sausages can be obtained that can be stored at 12°C for at least 60 days, which are free of visible mould growth on the coating.

The, to be covered, food products needs minimal dimensions to obtain homogeneous coating characteristics and mould-like appearance. The SSA, specific surface area of the foodstuff, is preferably equal or less than 1 m² / kg to obtain homogeneous covered food products with sufficient amounts of coating material.

The amount of needed powder material to obtain a regularly covered food will preferably be in a range of 0.005 – 10 g / dm², more preferably in a range of 0.01 – 7 g / dm² and most preferably 0.1 – 5 g / dm².

EXAMPLES

Example 1

5 To standard rice flour (grade powder), natamycin was added to a final concentration of 1000 ppm. This composition was homogeneous mixed.

The rice flour/natamycin mixture was used as coating by dipping (electrostatically) washed (and dried) fermented salami type sausages in the mixture.

The amount of used flour mixture is ± 10 kg per ton of sausage.

10 The sausages are stored at 85% RH and 12°C and checked on mould growth. As reference washed (and dried) sausages treated with only rice flour, of the same type as used for the mixture, are stored as well. The trial resulted in the following results

	Visible moulds			
	After 0 days	After 10 days	After 30 days	After 60 days
-				
Reference salami (rice flour treated)	-	+/-	++	++
Invention salami (rice flour/natamycin) treated	-	-	-	-

15 - no mould visible

+/- hardly any mould visible

+ mould visible

++ many mould spots visible

20 Whole cheeses or part of cheeses can be used in this method as well.

CLAIMS

1. Food product having a mould-like appearance which has a coating of a powder which gives a mould-like appearance, whereby the powder comprises an antifungal compound.
2. Food product according to claim 1 which is a cheese or sausage.
3. Food product according to claim 1 or 2 whereby the powder is flour or starch.
4. Food product according to any one of claims 1-3 whereby the antifungal compound is a polyene fungicide preferably natamycin.
5. Food product according to claim 4 whereby 0.005-10 mg of natamycin per dm² of surface area of food product is present.
6. Food product according to anyone of claim 1-5 which is storable for 60 days after production at 12°C in open air conditions.
7. Method for coating a food product which comprises adding a dry powder to the surface area of a food product, whereby the dry powder comprises an antifungal compound.

ABSTRACT

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The present invention relates to a food product having a mould-like appearance which has a coating of a powder which gives a mould-like appearance, whereby the powder comprises an antifungal compound.